

WHAT IS CLAIMED IS:

1. A method for enhancing ground situational awareness to an aircraft operating at an airport, said method comprising:

displaying, within the aircraft, runways and taxiways for the airport;  
and

5 displaying a position of the aircraft with respect to the runways and taxiways, a resolution of at least one of a runway, a taxiway, and an aircraft position based on at least one of a selected resolution, a position and heading of the aircraft, a taxi speed, and a ground speed of the aircraft.

10 2. A method according to Claim 1 wherein displaying the runways and taxiways comprises accessing a database of airport runways and taxiways.

3. A method according to Claim 1 wherein displaying the runways and taxiways comprises displaying the runways and taxiways in a graphical map form.

15 4. A method according to Claim 1 wherein displaying the runways and taxiways comprises displaying runways in a first color and taxiways in a second color that is different than the first color.

5. A method according to Claim 1 wherein the resolution is based upon a threshold distance between the aircraft and a centerline of a runway.

20 6. A method according to Claim 5 wherein a minimum threshold distance between the aircraft and a centerline of the runway is a length of the aircraft added to a half width of the runway.

7. A method according to Claim 5 wherein the threshold distance is adjusted according to a taxi speed of the aircraft towards the runway.

25 8. A method according to Claim 1 wherein the resolution is based on a taxiway awareness feature which, when the aircraft is heading towards an intersecting taxiway, provides a highlighted indication of the intersecting taxiway

when an intersecting distance between the aircraft and the intersecting taxiway is less than a preset value.

9. A method according to Claim 8 wherein the preset value is adjusted according to a taxi speed of the aircraft towards the intersecting taxiway.

5 10. A method according to Claim 1 further comprising displaying a taxiway label which travels along with a position of the aircraft on the display.

11. A method according to Claim 1 further comprising displaying a runway label and color-highlighted runway outline on the display when a position of the aircraft is within a threshold distance from the runway.

10 12. A method according to Claim 1 wherein the resolution is based on predicting a next position of the aircraft within a decision time frame.

13. A method according to Claim 1 further comprising determining if ground taxi operations for the aircraft are proceeding according to a provided clearance.

15 14. A method according to Claim 1 further comprising obtaining a position and heading for the aircraft from a flight management system.

15. A method according to Claim 1 further comprising highlighting a runway the aircraft is about to land on or take off from based on a current position and heading of the aircraft.

20 16. A method according to Claim 1 wherein the resolution is based on providing a runway awareness display when a distance between a center of the aircraft and a runway centerline is less than a threshold value.

25 17. A method according to Claim 1 wherein determining a resolution for the display comprises providing a runway awareness display when a heading of the aircraft is substantially aligned with a runway direction.

18. A ground situational awareness system for an aircraft, said system comprising:

a database of runway and taxiway map information for a number of airports;

5 a display for displaying runway maps, taxiways maps, and a position of the aircraft with respect to the runways and taxiways; and

a graphics generation computer communicatively coupled to said display, said computer receiving a position and a heading for the aircraft from an external source, said computer configured to access said database to retrieve runway and taxiway map information, said computer configuring the runway and taxiway map information and the position and heading for the aircraft for displaying an aircraft position with respect to the runway and taxiways on said display.

19. A situational awareness system according to Claim 18 wherein said display comprises a resolution selection capability which is communicated to said graphics generation computer, said computer configuring the map information and the position and heading for the aircraft to the selected resolution for displaying on said display.

20. A situational awareness system according to Claim 18 wherein said graphics generation computer comprises an input for receiving a taxi speed for the aircraft, said computer selecting a resolution for the display of the aircraft and map information on said display based on the taxi speed.

21. A situational awareness system according to Claim 18 wherein said system is configured to display the runways and taxiways for an airport in a graphical map form.

22. A situational awareness system according to Claim 18 wherein said display is configured to display map information for runways using a first color

and display map information for taxiways using a second color, the second color being different from the first color.

23. A situational awareness system according to Claim 18 wherein a resolution for the map information and the aircraft is based upon a threshold distance between the aircraft and a centerline of a runway.

24. A situational awareness system according to Claim 23 wherein said system adjusts the threshold distance according to a taxi speed of the aircraft toward the runway.

25. A situational awareness system according to Claim 18 wherein said system comprises a taxi awareness feature which, when the aircraft is heading towards an intersecting taxiway, causes said display to provide a highlighted indication of the intersecting taxiway when an intersecting distance between the aircraft and the intersecting taxiway is less than a preset value.

26. A situational awareness system according to Claim 25 wherein the preset value is adjusted according to a taxi speed of the aircraft towards the intersecting taxiway.

27. A situational awareness system according to Claim 18 wherein said system is configured to display a taxiway label which travels along with a position of the aircraft on said display.

28. A situational awareness system according to Claim 18 wherein said system is configured to display a runway label on the display when a position of the aircraft is within a threshold distance from that runway.

29. A situational awareness system according to Claim 18 wherein said system is configured to predict and display a next position of the aircraft within a decision time frame based on the taxi speed.

30. A situational awareness system according to Claim 18 wherein said system comprises an input for receiving position and heading data for the aircraft.

31. A situational awareness system according to Claim 18 wherein said system is configured to highlight a display of a runway the aircraft is preparing to land on or preparing to take off from based on a current aircraft position and heading.

5 32. A situational awareness system according to Claim 18 wherein said system is configured to display a runway awareness display on said display when a heading of the aircraft is substantially aligned with runway direction.

33. A unit programmed to provide ground situational awareness for an aircraft, said unit configured to:

10 access a database of runway and taxiway map information for an airport;

receive position and heading for the aircraft from an external source;  
and

15 generate data which causes a display of runway maps, taxiways maps, and a position of the aircraft with respect to the runways and taxiways to be displayed on an external display.

34. A unit according to Claim 33 comprising an input for receiving a taxi speed for the aircraft, said unit configured to select a resolution for the display of the aircraft and map information based on the received taxi speed.

20 35. A unit according to Claim 33 configured to select a resolution for the display of the map information and the aircraft based upon a threshold distance between the aircraft and a centerline of a runway.

36. A unit according to Claim 35 comprising an input for receiving a taxi speed for the aircraft, said unit configured to adjust the threshold distance according to a taxi speed of the aircraft toward the runway.

25 37. A unit according to Claim 33 configured with a taxi awareness feature which, when the aircraft is heading towards an intersecting taxiway, causes a

display to provide a highlighted indication of the intersecting taxiway when an intersecting distance between the aircraft and the intersecting taxiway is less than a preset value.

- 5           38.    A unit according to Claim 18 configured with a runway awareness feature to be displayed when the aircraft is substantially aligned with a runway direction.